

REMARKS

Applicants thank the Examiner for the thorough consideration given the present application. Claims 8-10, 29-31 and 33-38 are now present in the application. Claims 8-10, 29, 30 and 37 are independent.

The Office Action dated May 2, 2008 has been received and carefully reviewed. Responsive thereto, Applicants' representative requested an Examiner Interview so as to solicit clarification as the basic premise of the rejection was unclear.

Examiner Interview

Applicants wish to thank the Examiner and her Supervisor for the courtesies extended to Applicants' representative during the interview, which was conducted on July 28, 2008. During the interview, the propriety of the rejections based upon Shoenfeld alone, as well as the combinations of Shoenfeld with Shaw and Ogiwara were discussed. Applicants' representative emphasized that there are both structural as well as functional differences between the instant claimed invention and the prior art devices. Functionally, all of the applied prior art uses devices which control the generated light so that the illuminator creates uniform illumination. Functionally, the claimed instant invention produces illumination that has brightness gradients, that is, non-uniform illumination, in two different directions across the illuminator. Structurally, the applied prior art, such as Shoenfeld for example uses absorptive layers to absorb light so as to produce uniform illumination. To the contrary, the instant application claims reflective layers used to reflect and transmit light in a manner so as to produce non-uniform illumination that has brightness gradients in two different directions.

Claim Allowability

Applicants especially wish to thank Examiner Shallenberger and Supervisor Lee for the indication at the conclusion of the Interview that amended independent claims 8-10, 29 and 30 are believed to avoid the applied prior art, but that the indication of allowability will depend upon the outcome of a follow-up review of the prior art. For compliance with 37 C.F.R. § 1.111, a complete reply to the outstanding issues is presented herein.

Rejections under 35 U.S.C. §103

Claim 8 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Shoenfeld. This rejection is respectfully traversed. A complete discussion of the Examiner's rejection is set forth in the Office Action, and is not being repeated here.

As discussed during the interview, the instant claimed invention differs from the applied prior art in two significant aspects, one functional and the second structural. Functionally, all of the applied prior art uses devices which control the generated light so that the illuminator creates uniform illumination. Functionally, the claimed instant invention produces illumination that has brightness gradients, that is, non-uniform illumination, in two different directions across the illuminator. Structurally, the applied prior art, such as Shoenfeld for example uses absorptive layers to absorb light so as to produce uniform illumination. To the contrary, the instant application claims reflective layers used to reflect and transmit light in a manner so as to produce non-uniform illumination that has brightness gradients in two different directions.

MPEP § 2143.01 specifically discusses proper motivation to modify or to combine references. Sections V and VI of § 2143.01 make clear that a "proposed modification cannot render the prior art unsatisfactory for its intended purpose" and that the "proposed modification cannot change the principle of operation of a reference." It is submitted that both of those legal principles are improperly violated by the current rejection which modifies Shoenfeld, because the modification proposed by the rejection of forming the features of Shoenfeld to make paint layer overlap layer 23 would totally change the operational principle of Shoenfeld and render it unsatisfactory for its intended purpose. We request that the Examiner carefully examine the cited sections of § 2143.01 and apply the principles therein to the facts in this case, and suggested that when properly applied these sections would dictate that the rejection of record be withdrawn as unreasonable.

As stated above, the rejection states that Shoenfeld layers 23 and 27 form a brightness gradient and that it would have been obvious to "make layer 27 overlap layer 23 (via adhesive or the like) in order to simplify the manufacturing process." To the contrary, Applicants respectfully submit that the reflector 23 of Shoenfeld is clearly disclosed as "reflective paint" that contains "an absorptive medium", not a layer that has a predetermined level of light

reflectance and transmittance, as claimed. Shoenfeld provides a construction featured by a reflector 23 having a pattern of an absorptive medium 27 as shown in Figure 5. In particular, the reflector 23 has a reflecting surface provide with absorptive dot patterns (having low reflectance) with a different density of dots for each region therein. In other words, the different dot patterns having suitable dot density are arranged on the surface so that regional reflectance of the surface is increased as being apart from oval portions 28.

This is quite different from the construction of the present invention wherein a plurality of reflection sheets are overlapped within a specified region of the surface of the object to be illuminated so that the specified region can have reflectance higher than that of other areas each having only one reflection sheet. These reflection sheets possess the property such that they can reflect incident light with high reflectivity but allows a part of the light to pass. Accordingly, the reflectance of the region increases as the number of overlapped sheets thereof increases. Namely, reflectance of the overlap of three sheets is larger than that of one sheet or two sheets. If the first and second layers have a reflectance of 80%, the reflected light quantity of the first region is increased by about 20% over that of the second region, inasmuch as the reflectance of the second region is 80% and the reflectance of the first region is 80% plus the reflectance from the underlying layer or $80\% \times 20(\text{the light that went through}) = 16$, so $80 + 16 = 96\%$ of the light is reflected. As described in the application, the invention in the claims is quite opposite to that in the cited prior art (Shoenfeld), and thereby a brightness gradient can be provided.

In addition, Applicants respectfully submit that the pattern 27 of oval portions 28 on reflector 23 of Shoenfeld is not disclosed as overlapping layers, nor are there reflection layers overlapped at a position equivalent to the central portion of the object's surface to be illuminated. In addition, the Examiner has not presented any factual evidence establishing that overlapping them would be obvious. Moreover, making them removable in the manner suggested would destroy the very purpose of Shoenfeld's illuminator, which is to provide "uniform illumination intensity" as stated in the Abstract and provide "even lighting over its surface"; column 1, lines 8-11.

Applicants respectfully submit that independent claim 8 recites a combination of elements in a backlight unit, wherein the reflection portion forms a brightness gradient that varies in two directions. To the contrary, Shoenfeld provides uniform brightness in both directions on the surface of the object to be illuminated. For example, Shoenfeld describes that "The invention is more specifically concerned with an x-ray illuminator that provides even lightning over its surface without bright or dark areas to facilitate film-based studies by radiologists or other professionals." (col. 1, lines 8 to 12); "The current international standards for x-ray illuminators, which have been proposed for the United States, include the need for uniformity of light output across the entire viewing surface of the front diffuser screen." (col. 1, lines 44 to 47); "To obtain uniform illumination ..." (col. 2, line 52); "...this invention intentionally reduces light output in the brightest areas of the illuminator to equal that of the areas of lowest illumination" (col. 3, line 12 to 15); "..., uniformity is achieved using presently existing non-uniform lamp tubes, ..." (col. 3, lines 21 to 22); "...to achieve uniformity" (col. 3, line 39); "to make the output more uniform" (col. 3, line 49). Shoenfeld even states that "It is recommended that when the fluorescent lamps are installed, both initially and later to replace a failed tube, all four tubes 22 be replaced at the same time, with tubes from the same batch or lot." (col. 5, lines 22 to 26), Shoenfeld asserts it is necessary to prevent the brightness on the object's surface to be illuminated from being non-uniform.

Applicants respectfully submit that this combination of elements as set forth in independent claim 8 is not disclosed or made obvious by the prior art of record, including Shoenfeld, for the reasons discussed above. Accordingly, reconsideration and withdrawal of this rejection are respectfully requested.

Claims 9, 10, 33 and 34 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Shoenfeld in view of Shaw. This rejection is respectfully traversed. A complete discussion of the Examiner's rejection is set forth in the Office Action, and is not being repeated here.

The Examiner states that Shoenfeld "lacks the teaching of making the brightness of the light source located at the central portion...relatively higher than the brightness of the light sources located at both ends." Shaw is relied upon for a teaching of "adjusting the brightness of the light

sources located at the center so that the central portion is illuminated relatively higher than both ends.”

Applicants respectfully submit that the Examiner has correctly characterized the Shoenfeld disclosure, since it designed to give totally uniform illumination. As described above for claim 8, claims 9 and 10 also describes the feature of having a first region with the reflection layers being overlapped at a position equivalent to the central portion on the object's surface to be illuminated by the plurality of light sources. In Fig. 5 of Shoenfeld, there is no region with reflection layers overlapped at a position equivalent to the central portion of the object's surface to be illuminated by the light sources. Claims 9 and 10 also include the feature of making the brightness of the light sources located at the position equivalent to the central portion on the surface to be illuminated relatively higher than the brightness of the light sources located at both ends.

But the Examiner's reliance upon Shaw is not understood, as it also is designed to provide a dimmable backlight that avoids “non-uniformed luminance artifacts within the display that would be objectionable in a primary flight display application.” That is, Shaw's backlight also provides uniform light, not light brighter in the center than at the ends. So it is not clear how one could combine two references that are limited to providing uniform backlight illumination and result in a backlight that requires a brightness gradient, i.e. the value of light that varies in both the horizontal and vertical directions as claimed. Both Shoenfeld and Shaw teach away from this feature of the instant invention, and would destroy the function of Shoenfeld for its intended purpose and change the principle of operation of Shoenfeld.

Finally, Applicants respectfully submit that independent claims 9 and 10 recite a combination of elements in a backlight unit wherein the reflection portion comprises at least a first and a second reflection layer having a predetermined level of light reflectance and transmittance, and a first region with the first and second reflection layers being overlapped at a position equivalent to the central portion and a second region consisting of the first reflection layer only, and a brightness gradient that varies in two directions. Applicants respectfully submit that this combination of elements as set forth in independent claims 9 and 10, nor therefore in dependent claims 33 and 34, is not disclosed or made obvious by the prior art of record, including

Shoenfeld and Shaw, for the reasons discussed above. Accordingly, reconsideration and withdrawal of this rejection are respectfully requested.

Claims 29, 30, 31 and 35-38 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Shoenfeld in view of Ogiwara. This rejection is respectfully traversed. A complete discussion of the Examiner's rejection is set forth in the Office Action, and is not being repeated here.

The Examiner states it would have been obvious in view of the lamp spacing in Figure 7 of Ogiwara to make the lamp clearance smaller at the center of the Shoenfeld backlight, to increase the luminance in the central portion. Once again, Applicants submit that such a modification of the Shoenfeld device would destroy it for its intended purpose, which is uniform illumination of medical x-rays, and is therefore not obvious. With reference to Fig. 7, Ogiwara discloses making the clearance of the fluorescent lamps located at the position corresponding to the central portion of the object to be illuminated relatively smaller than the clearance of the fluorescent lamps located at both ends and the output of each lamp may be changed to attain uniformity on the illuminated surface (in paragraph [0285]). However, Ogiwara's construction makes the brightness of the fluorescent lamps higher by making the clearance between the fluorescent lamps located at the position corresponding to the central portion of the object to be illuminated smaller, and instead makes the brightness of the fluorescent lamps located at both ends lower by making the clearance between the fluorescent lamps located on the both ends larger. Thus, once again, if Ogiwara's system were to be applied to Shoenfeld, it would destroy the uniform light that Shoenfeld states is critical to the proper reading of X rays.

Claims 29, 30 and 37 include the feature of making the clearance between the fluorescent lamps located at the position corresponding to the central portion of the object to be illuminated relatively smaller than the clearance between the fluorescent lamps located at both ends. The Examiner asserts that this feature is disclosed by Ogiwara, whose teaching can be easily applied to the illuminator of Shoenfeld. Claim 37 also includes the feature of making the brightness of the fluorescent lamps located at the position corresponding to the central portion of the object to be illuminated relatively higher than the brightness of the fluorescent lamps located at both ends. The same argument as described above for claims 8, 9 and 10 is applicable to these claims.

Applicants respectfully submit that this combination of elements as set forth in independent claims 29, 30 and 37, and therefore in dependent claims 31, 35, 36 and 38, is not disclosed or made obvious by the prior art of record, including Shoenfeld and Ogiwara, for the reasons discussed above. Accordingly, reconsideration and withdrawal of this rejection are respectfully requested.

Additional Cited References

Since the remaining reference cited by the Examiner has not been utilized to reject the claims, but has merely been cited to show the state of the art, no comment need be made with respect thereto.

Conclusion

All of the stated grounds of objection and rejection have been properly traversed, accommodated, or rendered moot. Applicants therefore respectfully request that the Examiner reconsider all presently outstanding rejections and that they be withdrawn. It is believed that a full and complete response has been made to the outstanding Office Action, and as such, the present application is in condition for allowance.

Should there be any outstanding matters that need to be resolved in the present application; the Examiner is respectfully requested to contact Paul T. Sewell, Reg. No. 61,784 at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37.C.F.R. §§1.16 or 1.14; particularly, extension of time fees.

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Respectfully submitted,

By 

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